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TECHNOLOGY DEPT:  
**SCIENCE NEWS LETTER**

JAN 18

DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JANUARY 13, 1945



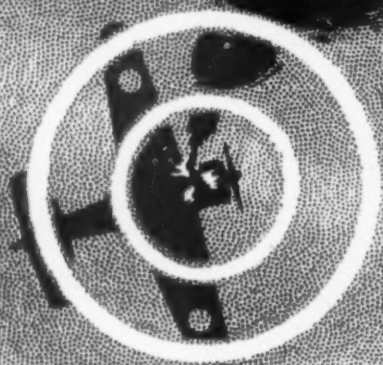
**Ancient God**

See Page 24

A SCIENCE SERVICE PUBLICATION

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## CURIOUS FACTS ABOUT LIGHTING



**LIKE SHOOTING FISH IN A BARREL . . .** There was a time when Jap Zeros could "sit in the sun" and come in with guns blazing—protected from our gunners by blinding sunlight. Not long ago, they had an unpleasant surprise. U. S. Army and Navy gunners now have a new Westinghouse gunsight lamp that lets them fire with deadly accuracy—directly into the sun. Formerly, our gunners could aim within only 15 degrees of the sun, leaving a dreaded "blind spot". This has now been removed—and, with it, a lot of Japs.

Lamps of 10,000 different types, using from 1/10th to 10,000 watts—incandescent, fluorescent, infrared, ultraviolet lamps, produced at the rate of about 1,000,000 units daily—lamps for seeing, for heating, for fighting disease—wherever you see the Westinghouse Mazda Trade Mark, you'll find top quality!



**CEILING, 2000 . . .** Vital "ceiling" information is provided for American fliers by alidade sighting device, which "draws a bead" on a cloud—illuminated by giant Westinghouse searchlight. Height is read directly in hundreds of feet.



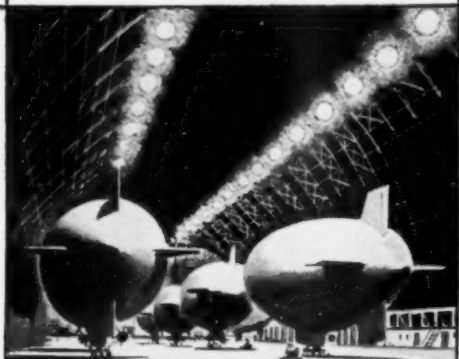
**HAM AN' . . .** New sealed-beam landing lights for army bombers are so powerful that a Westinghouse engineer actually cooked a meal on the surface of an up-turned lens. Infrared rays did the trick.



**DAVY JONES** could find good use for this 1000-watt sea salvage lamp. Inside are loose grains of tungsten which the diver can whirl against the glass—to scour off clouding particles emitted by the filament.



**SELF-CONTAINED SUN LAMP**, developed by Westinghouse, produces comfortable warmth with infrared, as well as beneficial ultraviolet rays. Mercury vapor, electrodes, reflector, and incandescent filament are sealed in a reflector bulb of special glass, which screws into any lamp socket.



**MAXIMUM "SEE-ABILITY"** is provided by Westinghouse 3-kilowatt mercury lamps—in blimp hangars, airplane factories, steel mills, etc. These lamps produce 120,000 lumens of light.

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Sunday, 2:30 pm, EWT, NBC

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## MEDICINE

# Plastic Artificial Eyes

Army dentists turn from making false teeth to creating plastic eyes that look so much like natural ones it is hard to tell them apart.

► THANKS to three Army dental officers skilled in making false teeth of plastic material, artificial eyes of plastic instead of glass are now being created for wounded veterans and soldiers inducted with glass eyes, the War Department has announced.

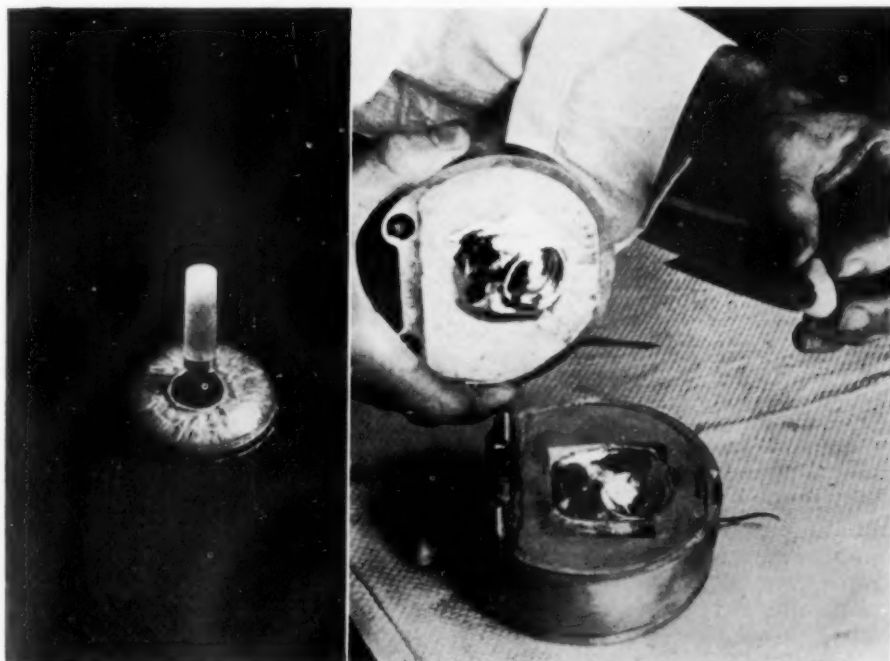
The plastic looks so much like the natural eye that it is difficult to tell them apart. Skillful tinting and anatomical construction account for part of the natural appearance.

Exact fitting of the plastic eye into the socket makes considerable movement possible and this avoids the staring look of some glass eyes. The plastic eye is

lighter than a glass eye and soldier patients who have worn both say the plastic eyes feel better.

Important additional advantage is the fact that the plastic eyes are practically indestructible. Glass eyes break easily if dropped. Plastic eyes are also less expensive. One can be made for something less than \$5 and rivals the custom-made glass eye that may cost up to \$300.

The three dental officers who are credited with this latest Army medical development are Capt. Stanley F. Erpf, of San Francisco; Major Milton S. Wirtz, of Latimer, Iowa; and Major Victor H. Dietz, of Chicago.



**IRIS BUTTON**—First step in making a plastic eye is to paint the thin disk which becomes the iris. From seven shades of standard, non-fading oil pigments, the exact shading of the patient's natural eye is duplicated. A jet black solid disk placed on the back of the iris simulates the pupil. Iris disk plus pupil are imbedded in a tiny plastic lens which serves as magnifier to enlarge and intensify the eye pattern and color. This unit of iris disk and lens (left) is called the iris button. The cylinder projecting from the center in the photograph is used for handling the iris button until it is set in the acrylic resin which makes the rest of the plastic eyeball. This is baked under pressure in a mold (right) made from a wax impression of the patient's eye socket so that it fits exactly. Official Army photographs.

Capt. Erpf got to work on the problem while stationed in a hospital in England where he encountered a soldier who had to wait four weeks to get a glass eye from a supply depot, then dropped and broke it the next day, and was faced with another long wait for a second eye.

About the same time Major Wirtz at Camp Crowder had a dental technician who lost an eye. He could not be fitted with a stock eye and even after he had been sent to Chicago to get a custom-built eye the result was not very good. Major Wirtz thought he could make him a better one out of the plastic material used in dentistry.

Major Dietz, meanwhile, was experimenting with various dental plastics while stationed at Atlantic City, N. J.

On orders from the Office of the Surgeon General, the three were brought to Valley Forge General Hospital, Phoenixville, Pa., to found the artificial eye laboratory. Within six months they had perfected their techniques so that they could train other men in 30 days to make plastic eyes. Each of these three has now been assigned to other areas in the country to continue experimentation and to train still more technicians in the art of making plastic eyes.

*Science News Letter, January 13, 1945*

## AGRICULTURE

## Productivity Increased By Use of Cytotoxins

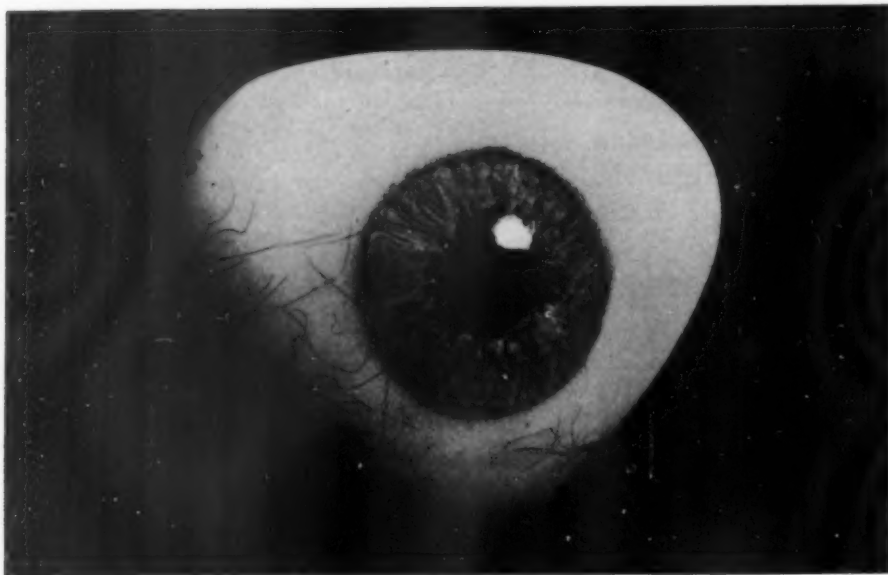
► MORE MILK from cows, more eggs from hens, higher productivity from other farm animals, can be obtained by just slightly poisoning them with cell-attacking substances known as cytotoxins, declares a Russian experimenter, Docent A. Peterburgsky. His results were described before a conference held in Moscow at the Timiryazev Agricultural Academy, by Prof. K. Viktorov.

Cytotoxins are naturally formed poisons that occur in blood serum. There are a number of them, and each attacks only the cells in one specific organ or tissue. Thus, there is a cytotoxin specific for kidney cells, known as nephrotoxin; another for liver cells called hepatotoxin, etc. Their effects in the medical field have been the subject of long study.

Using very dilute doses of appropriate cytotoxins, Docent Peterburgsky claims to have increased milk yield in cows by as much as 65%. He states further that he has increased the productivity in laying hens, and made layers out of non-producers.

Especially striking are the results which





**COMPLETED PLASTIC EYE**—After tinting and molding, the plastic eye is polished and given veins of rayon fibers to duplicate the veins of the natural eyeball. Finally it is dipped in a clear solution of plastic to give a gleaming coating similar to the layer of liquid which covers the normal eye.

Docent Peterburgsky has obtained with apparently sterile mares; a high proportion of them are said to have successfully foaled.

Greatly stimulated growth in pigs is also claimed for the cytotoxin treatment. Ten-week-old shoats were injected with moderate doses; after seven months the

average weight of the treated animals was 20% higher than that of untreated controls.

No untoward effects were noted following cytotoxin treatment in the low concentrations used. The only effects observed were slight enlargements of the particular organs involved.

*Science News Letter, January 13, 1945*

#### MEDICINE

## Surgical Speed-Up

► SOVIET SURGEONS are now returning to the ranks 71% of soldiers with injuries to the mandible, or lower jaw, Dr. N. M. Michelson, professor of mandible surgery at Doctors Post-Graduate Institute and vice-director of the Institute of Traumatology and Orthopedics, reports to the Soviet Scientists Anti-Fascist Committee.

This figure has not yet been surpassed in any other country, Prof. Michelson states.

What might be called a surgical speed-up is credited by Prof. Michelson for the results he reports.

"One of the reasons that we have been able to achieve such results," he states, "is undoubtedly the rapid change in views which took place among our surgeons during the early stages of the war.

"Before the war we were always of the opinion that the wound could be sutured only within a few hours of its

having been inflicted and that a plastic operation to the face was only permissible some six or eight months after the wound had healed, while bone grafting had to wait at least a year."

Plastic operations involving skin grafting are now begun within three or four weeks after the wound was inflicted and sometimes even without waiting for the wound to heal completely, Prof. Michelson reports. Bone grafting is done within one or two months, using slivers from the ilium or ribs and cartilage to replace bones in the lower jaw.

The use of cartilage opens up many new possibilities for rehabilitation, Prof. Michelson says. It simplifies what was formerly an exceedingly intricate operation and puts it well within the reach of the average surgeon. The operation itself is almost painless.

To prevent locking of the jaws, flexible steel pins invented by Dr. Pomer-

antseva are used. These almost entirely obviate the necessity of using jaw hinging.

"Mandible orthopedics" has now developed to such an extent, Prof. Michelson reports, that the chewing functions of the lower jaw can be almost completely restored.

*Science News Letter, January 13, 1945*

*Cotopaxi*, the 19,600-foot Ecuadorean volcano, is the highest active volcano in the world; its almost perfect conical top is covered with snow except at the margin of the crater.

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## HORTICULTURE

# Vegetables for Greece

Soilless gardens may be used to provide nourishment to the half-starved people of Greece; Air Quartermaster develops hydroponics in Philippines.

► GREECE MAY BE able to give her half-starved people the essential green vegetables they need so badly to regain health by setting up soilless gardens to feed the people in blocks of 20,000, reported Maj. E. W. Elliott, Chief of the Supply Planning Division, Office of the Air Quartermaster, War Department, during an interview with Watson Davis, director of Science Service, on the CBS program "Adventures in Science."

Soilless gardens, in which vegetables are grown without soil, the necessary minerals being supplied artificially, are springing up all over the world, Maj. Elliott stated. By March 1, he predicted, almost 10,000 G.I.'s will be enjoying garden-fresh foods grown by hydroponics, the scientific name for soilless gardening.

The Air Quartermaster has three objectives in mind in carrying on its program of hydroponics. First, to supply fresh garden vegetables to our troops and flying crews in war theaters. Second, to provide a rehabilitation program for convalescent airmen at Coral Gables, Florida. Soilless gardening is a healthful outdoor occupation, and also trains the men in a skill which may prove profitable after the war. Finally, to help build morale. In the war theaters all of the soilless gardens are cultivated by soldiers in their free-hours as a voluntary job, Maj. Elliott remarked.

Tomatoes are ready for harvest, with soilless gardening, 120 days after the bed is prepared, he commented. In Hawaii, green peppers are being grown by hydroponics. This is the first time that the people of the islands have ever been able to grow green peppers. For some reason they will not grow in Hawaii under normal methods of cultivation.

The head of a hospital in the Philippines has asked the Air Quartermaster to build a soilless garden to supply raw vegetables for the food of convalescent soldiers. Raw vegetables must be grown by the soilless method in the Philippines to prevent diseases which are present in the soil from being transmitted to other persons.

Seeds and chemicals for soilless gardens are shipped by air to the point where

the garden is to be established. There, under the instruction of one of two teams of trained hydroponics experts, volunteers set up the gardens. Once a garden is in operation, Maj. Elliott pointed out, the team moves on to set up a garden at another point. Frequently these gardens are cultivated within earshot of battle. The vegetables most successfully grown include tomatoes, beans, carrots, cucumbers and radishes.

"From our wartime experience with hydroponics," Maj. Elliott remarked, "there is likely to develop an important peacetime industry. We can grow vegetables by hydroponics out of their regular growing season in such places as Florida, Texas, and Cuba."

When air freight rates are reduced, these out-of-season vegetables could be transported garden-fresh to parts of the country where they would not otherwise be available. Already at least two airlines are planning the transportation of fresh vegetables grown by hydroponics after the war, he stated.

Major Elliott urged that more persons take an interest in soilless gardening, predicting that after the war there is going to be a lot of activity in the field.

Many young people are taking an interest in hydroponics Mr. Davis told the radio audience. He pointed particularly to Science Clubs of America such as the Faraday Club of Roosevelt Senior High School at Roseburg, Oreg., which has 14 members studying hydroponics; and the Retort and Scalpel Club of Moundsville, W. Va., which features soilless gardening as one of their projects.

*Science News Letter, January 13, 1945*

## AERONAUTICS

## Present Rescue Equipment Too Heavy for Postwar Use

► LIFE-rafts, life-preservers and accessories, including emergency communications equipment developed for military use during this war, are too heavy and take up too much space on a plane to make them practical for use after the war by ocean-hopping airlines, William H. Hall, of the Transatlantic Division of American Airlines, Inc., told the meet-

ing of the Institute of the Aeronautical Sciences in Washington, D. C.

Using present-day air-sea rescue equipment, now provided on Army transport planes, to provide safe handling of passengers in the event of a crash or accident at sea, the postwar airliner would have to carry over 18 pounds of sea-rescue equipment for every passenger and crew member aboard. This would total 1,266 pounds, and take up 59 cubic feet of space, Mr. Hall stated.

Present Army equipment is designed for use in any theater of war, and therefore must have special features not necessary in equipment for transoceanic passenger airline use.

A study of designs for equipment more particularly suited to the special requirements of over-sea commercial planes indicates that adequate life-rafts, life-belts and radio sets can be provided for a 70-passenger plane within an overall weight of 546 pounds per plane, as compared with 1,266 pounds on the basis of present military equipment. This means a saving of 720 pounds which can be utilized in additional payload.

In the case of the inflatable rafts and life-belts, the weight saving is to be achieved by designing for the same efficiency and strength in lighter-weight materials, possibly nylon. It is believed, for example, that suitable life-vests can be made that will weigh only 1.5 pounds each.

For radio equipment, no reduction in total weight is contemplated; the aim instead is to develop a set of about the present weight with greater efficiency and therefore longer range.

Another task for radio engineers, Mr. Hall pointed out, is the development of radar equipment that will spot drifting life-rafts at night or under conditions of bad daytime visibility.

"It is imperative," the speaker said in conclusion, "that all interested carriers give this matter immediate attention, since the development of lightweight, compact and efficient equipment must commence immediately if such equipment is to be accommodated in the design of aircraft now on the drawing-boards."

"Standardization of such equipment is highly desirable. It has been recommended by officials of the C.A.B. and the C.A.A. that the project of standardization be turned over to the Air Transport Association, which would act as coordinating agency to recommend resultant findings to the C.A.B."

*Science News Letter, January 13, 1945*



## GEOLOGY

# Carbon Supplies Renewed

Volcanoes will make life on earth possible indefinitely by keeping carbon in circulation; gloomy expectations of a dead earth dispelled.

► GLOOMY expectations of a dead earth, with all life made impossible because all existing carbon has become locked up in vast beds of limestone and other unavailable compounds, will not be realized because volcanoes will continue to keep carbon in circulation, belching immense quantities of carbon dioxide into the atmosphere where plants can capture it and convert it into food for themselves and for plant-eating animals. So declares a New Zealand geologist, Prof. C. A. Cotton of Victoria University College, Wellington, N. Z. (*Nature*).

Prophecies of doom through worldwide carbon starvation are based on the assumption that the supply of "free" carbon in the atmosphere (mainly as carbon dioxide) was set up once for all in the world's geologic youth. Heavy permanent withdrawals by plants, as coal, and by animals, as limestone, chalk, etc., have greatly reduced the amount of available carbon, according to this theory. Burning of coal and oil returns only a fraction of the carbon to the atmosphere, for man uses only the cream of these combustible carbon deposits. Carbonaceous rocks must be considered permanently "frozen" carbon assets.

With most of this Prof. Cotton disagrees. He admits that the primitive atmosphere may have contained a considerably higher percentage of carbon dioxide than it now does; but with volcanic action constantly going on he does not see any prospect of our present supply being completely exhausted. The principal gases given off by volcanoes are water vapor and carbon dioxide. The water vapor of course condenses as rain; the carbon dioxide remains gaseous until captured as food material by plants or taken into solution by water.

Volcanic renewals of the earth's free carbon supply are not made at an even rate. The present seems to be a time of comparatively low volcanic activity. In fairly recent geologic time, however, there have been very vigorous volcanic outpourings, as for example when the tremendous lava fields of the northwestern United States were formed.

Prof. Cotton has undertaken to recalculate the total mass of the earth's

primitive atmosphere. He arrives at a figure of 76,000,000,000,000 (76 quadrillion) metric tons. Of this 70,200,000,000,000,000 tons consisted of carbon dioxide alone, the remaining quantity being made up mainly of nitrogen and hydrogen. The nitrogen is still in the air; the hydrogen long ago combined with oxygen and became a part of the earth's water supply.

*Science News Letter, January 13, 1945*

## PSYCHIATRY

## Alcoholism Seven Times More Prevalent Among Men

► WHY MEN get drunk was the question which Dr. Abraham Myerson of Harvard Medical School undertook to answer at the meeting of the American Association for the Advancement of Science in Cleveland. It is fair to specify "men," incidentally; according to Dr. Myerson's figures alcoholic addiction is seven times more prevalent among men than it is among women.

While it is true that the disease of alcoholism is more common among some racial or national groups than it is among others, there is nothing to indicate that such "peoples are more neurotic or psychotic than the temperate folk who suffer just as much, or more, from anxiety, depression, inferiority and such-like states, and still do not seek the so-called escape" via the bottle.

Heavy drinking, as such, does not constitute alcoholism, the speaker explained. True alcoholism sets in when alcohol is craved as a drug—when the victim of a hangover needs more alcohol as a remedy for the wretched condition in which he finds himself. But heavy drinking is a highway to chronic alcoholism, he warned.

Four types of alcoholics which Dr. Myerson described are: the man who is socially ill-at-ease until he has had a couple of drinks, the spree drinker who just can't stop after he has had one glass, the individual afflicted with a mental disorder of which alcoholism is only one symptom, and the aimless drifter type "who become the hobo and the bum, who drift into alcoholism as the least



**NEW PRESSURE SUIT**—The suit's bladders over abdomen, thighs and calves, automatically inflated or deflated by valves as the force of gravity rises or falls, keep blood from pooling in the legs. Result: the heart can supply enough blood to the brain to prevent visual blackout and unconsciousness.

active of the pleasures of life and who finally become complete addicts, living only to drink."

For remedies, the speaker called for treatment that goes to the roots of things: "Here, as in all mental hygiene programs, there will be encountered the corruption of society, the social evils of slums and unemployment—in short, a social psychopathology which will have to be squarely and honestly faced before the problem of alcoholism can be adequately understood and handled."

*Science News Letter, January 13, 1945*

## INVENTION

## Oyster Harvesting Is Now Mechanized

► MECHANIZATION comes to another industry that has always been pretty much on a handicraft basis in the invention on which J. M. Jurisich of New Orleans has received patent 2,363,251. It is a machine for harvesting oysters. A big drum, carrying a series of semi-flexible loops, is mounted on a sledge that is dragged over the oyster bed. As it revolves, the drum dislodges the oysters, dropping them on an endless-belt conveyor that carries them up to the operating barge, where they are washed and packed.

*Science News Letter, January 13, 1945*

## MILITARY SCIENCE

# Some Jap Planes Better

Their "Betty 22" is superior to our B-25 Mitchell bomber, but their attempt to copy the B-29 proved to be unsuccessful.

► THE JAPANESE "Betty 22," a medium bomber, can fly 30 miles an hour faster than our B-25 Mitchell bomber and their four-engine patrol bomber, the "Emily," can fly at a maximum speed of 296 miles an hour, or 96 miles an hour faster than our Coronado PB2Y. There are also several other Jap planes that are superior to their U. S. counterparts. At the same time, many U. S. planes are superior to similar Japanese types in performance. For example, the copy-cat Japs tried to duplicate the B-29 in the "Liz," but their version was unsuccessful and at present is employed as a transport only.

The latest Jap planes to be seen in combat are the Frank I, which has a maximum speed of more than 400 miles an hour and a range of about 1,700 miles; the Jack II, a Navy interceptor, which has an 1,875 horsepower engine that thrusts the plane through the air at a

maximum speed of 400 miles an hour; the Irving II, a night fighter equipped with three or four 20 millimeter cannon that has a top speed of 330 miles an hour; and finally the Judy II, a dive bomber, which can fly 2,100 miles without a stop at a cruising speed of about 300 miles an hour.

There is every indication that while Japanese aeronautical research is still inferior to that of the United States, our fighters in the sky will be encountering bettered Jap planes. The Japs have borrowed liberally from the United States and Germany in designing their combat aircraft, and in some instances they have made improvements on the original models.

The chief weaknesses in Jap aircraft include insufficient attention to such details as leakproofing of fuel tanks and adequate armor protection for air crews; lack of sufficient experience in designing

very heavy high-altitude bombers; inferior control at high speeds, and inferior muzzle velocity of both fixed and flexible guns. Another point that should be brought out in totaling the weaknesses is that up to the present the Japs have exhibited a decided inferiority to the United States in training of pilots and air crews and in aerial tactics.

Aeronautical research in Japan is concentrated at the Imperial University in Tokio, with projects also being conducted at the Army Aircraft Establishment at Tokorozawa (the Jap Wright Field), the Naval Air Service Experimental Station in Tokio, and industrial laboratories.

The Japanese have a fondness for magnesium structures, and some of their castings are larger than any that the United States has produced. They use magnesium in engine nose structures, where U. S. plane builders prefer other metals. Magnesium, although lighter in weight than aluminum, burns rapidly and readily.

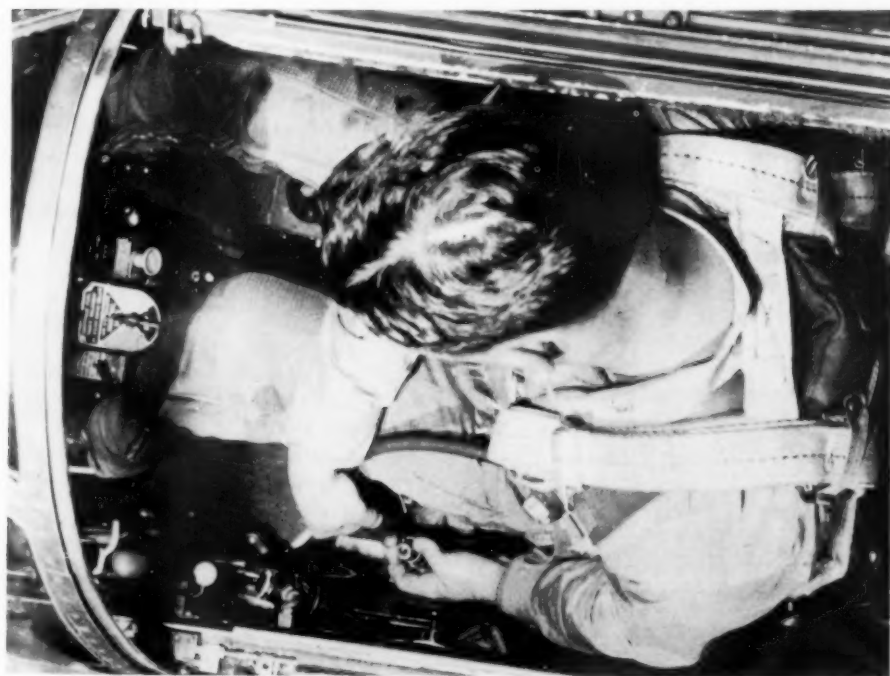
The outstanding features of the 10 known Jap fighter aircraft are their light weight, high rate of climb, long range, and exceptional maneuverability. The "Zeke 52" can climb 2,800 feet a minute at sea level. In general these fighters are more maneuverable at low speeds and less maneuverable at high speeds than U. S. Army and Navy fighters. Many Jap fighter planes to date are not built strong enough to withstand the high stresses developed in dives. Fighter plane armament is made up of a combination of 7.7, 12.7, and 20 millimeter guns.

Japanese aircraft fuels have a lower octane rating than those used in U. S. planes. While our planes use 100 octane fuels or better for high performance and extra power at take off, the Jap fuels have an octane rating of from 87 to 92.

The nomenclature used by the United States Army in referring to Jap planes is a code name. Roughly speaking they have been classified into bombers, using girls' names; fighters, using boys' names; and transports, using names beginning with the letter T, such as Topsy and Theresa.

Chief aircraft manufacturers in Japan are the Mitsubishi, Aichi, Kawanishi, Nakajima, and Sasebo firms. The bulk of Japan's military aircraft is produced by Mitsubishi, with at least 13 combat planes to their credit.

*Science News Letter, January 13, 1945*



**BLACKOUT PREVENTION**—By plugging his pressure suit into the plane's air line, the pilot shown in this official Army Air Force photograph protects himself against blackouts during high speed turns and pullouts from power dives.

Better brooms that will sweep cleaner are expected from a recently developed broomcorn which has an unusually large number of fine fibers in the brush.



## ENGINEERING

**New Supercharger for Use on V-Type Engines**

► A RECENT invention, which might be dubbed the poor man's supercharger, is a very simple device intended for use on liquid-cooled V-type engines. An exhaust-driven turbine pushes the air through a duct. Athwart this is placed a grille through which the coolant is circulated. This lowers the temperature of the air, which has been heated by compression. The Ford Motor Company is assignee of rights in this patent, No. 2,366,365, taken out by C. E. Sorensen of Detroit.

*Science News Letter, January 13, 1945*

## INVENTION

**Two-Level Seed Planter Insures Germination**

► A SEED-PLANTING machine that insures germination whether the season be wet or dry is the device on which patent 2,366,389 was granted to B. M. Deavenport of Clarksdale, Miss. The idea is very simple. A suitable blade draws a furrow, at the bottom of which a row of seeds is deposited. Immediately following is a big, blunt-toothed wheel, which pushes some of the seeds down a few inches, leaving the others at their original level. So if the season is dry, the deeper-planted seeds have the better chance for survival; if wet, the more shallowly-placed ones.

*Science News Letter, January 13, 1945*

## ENTOMOLOGY

**Bee Paralysis Due to Filterable Virus**

► A PARALYSIS that afflicts honeybees, causing wholesale death in the hives, has been found to be caused by a filterable virus, just as infantile paralysis in human beings is caused by another virus. The bee disease was traced to its microscopically invisible cause by Dr. C. E. Burnside of the Bureau of Entomology and Plant Quarantine.

Loss of hair from the bees' bodies, hitherto considered a symptom of honeybee paralysis, was found to be undependable as a means of diagnosis, for the bees to which he purposely gave the disease in his experiments did not become partially naked and shiny. Dr. Burnside is inclined to believe that loss of hair is not a true symptom at all, but is probably due to the tendency of other bees to bite and pull at the sick ones in

an effort to get them out of the hive. Much more dependable symptoms, he reports, are sprawled legs and wings and a general trembling of the whole insect.

Beekkeepers have hitherto been helpless when paralysis appeared in their colonies, because the cause has not been known. Now that it has been traced to a virus, means of prevention or cure can be sought for more intelligently, and with greater hope of ultimate success.

*Science News Letter, January 13, 1945*

## PHYSICS

**"Foo-Fire" Reports Leave Scientists Guessing**

► REPORTS of mysterious balls of fire racing along with American planes on night missions over Germany, nicknamed "foo-fire" by our pilots, have scientists frankly guessing. No one wants to venture a flat-footed opinion regarding either the nature or the purpose of the device. About the only point of general agreement is that it is certainly not radio-controlled, as some of the pilots have suggested.

If it follows the movements of planes as closely as the published descriptions state, it must make use of some attractive force, magnetic or otherwise, inherent in the plane itself, physicists believe. No known kind of control from the ground could make it stick so tight to the near neighborhood of its target.

Since the descriptions all agree that the mysterious fireballs have neither explosive nor incendiary effect, their purpose remains largely conjectural. The two most plausible guesses are: (1) they are intended to dazzle the eyes of the pilots, breaking down their carefully built-up night vision; (2) they serve as easily-followed aiming-points for flak gunners, rather than the elusive dark shape of the plane itself.

Some of the scientists quizzed about the "foo-fighters" were inclined to doubt their reality as actual Nazi weapons. The pilots may see lights, all right, they admitted; but these may be due to simple natural causes. One conjecture was that they may be some kind of silent electrical discharge, resembling the St. Elmo's fires sometimes seen dancing at mast-heads and spar-ends of ships. Another was that brilliant flak bursts produce the fiery, persistent "spots before the eyes" known to psychologists as after-images. An after-image seen out of the tail of one's eye might easily produce the impression of a ball of fire hovering near the wingtip.

*Science News Letter, January 13, 1945*

**IN SCIENCE**

## ARCHAEOLOGY

**Ancient Maori God Viewed by Navy Flyers**

See Front Cover

► THE ANCIENT MAORI god shown in the official U. S. Navy photograph on the front cover of this SCIENCE NEWS LETTER, provides interest for Navy flyers resting near Auckland, New Zealand. The statue was found in Rotarua, a nearby settlement. A utilitarian dinner bell now sounds the "voice of chow" from the ancient mouth.

American archaeologists say that not much is known to science about these Maori images, and one archaeologist expressed concern that a modern dinner bell had been placed in such an archaeological treasure. Perhaps the Navy men who see these ancient relics may bring back additional historical information about them.

*Science News Letter, January 13, 1945*

## CHEMISTRY

**Cellulose Ester Plastics Treated Against Warping**

► WEATHERING tests of cellulose ester plastics were reported at a meeting of the American Chemical Society by L. W. A. Meyer and W. M. Gearhart of the Tennessee Eastman Corporation. These outdoor tests were made in Florida, Arizona and Tennessee.

Cellulose ester plastics are widely used in industrial products. They have the property of breaking down on long exposure to outdoor conditions unless given special treatment. They are apt to become brittle and warp. This tendency is overcome, in part at least, by a treatment credited to Dr. G. M. Kline of the National Bureau of Standards. He found that the development of brittleness is inhibited by the addition of a suitable organic compound such as salol. This absorbs the ultraviolet rays of the sun and emits the resultant energy in some form not harmful to the plastic.

"The main conclusion to be derived from these weathering tests," the investigators stated, "is the striking ability of salol to inhibit the development of crazing and brittleness in cellulose ester plastics."

*Science News Letter, January 13, 1945*



# ANCE FIELDS

## CHEMISTRY

### Paint Containing DDT Found Deadly to Flies

► DDT, SYNTHETIC chemistry's most potent weapon against insects, bids fair to become a regular ingredient of interior paints and wall finishes, as a means of automatically ridding houses of flies and other pests. Experiments indicating this as a practical possibility are reported by two British paint chemists, G. A. Campbell and T. F. West (*Nature*).

Tests were first made with wire-screen cages, in which were placed plywood panels that had been coated with an oil-bound water paint containing 5% of DDT. Flies confined in these cages were all killed. Repetitions of the test after two months showed that the DDT-loaded paint was still lethal to flies.

Further tests were made on a larger scale by painting the walls of small rooms with the same material, except that the mixture was by accident made only one-tenth as strong in DDT—0.5% instead of 5%. Despite the greater dilution, the DDT in the paint killed 90% of the flies that roosted on the walls and ceilings overnight.

Harder finishes, like ordinary oil paints and synthetic varnishes, have thus far not proven successful as carriers of DDT, the two researchers report. This negative result they ascribe to the tighter adsorption of the oil film. They are, however, continuing their experiments with these types of coatings.

*Science News Letter, January 13, 1945*

## SEISMOLOGY

### Year-End Earthquake Located in Baffin Bay

► THE LAST earthquake of 1944, recorded as beginning at 9:20.8 p.m., EWT, Dec. 31, was traced to an epicenter under Baffin Bay by seismologists of the U. S. Coast and Geodetic Survey, on the basis of reports from three observatories wired to Science Service. The disturbance, which was a moderately strong one, was in the region of latitude 73 degrees north, longitude 70 degrees west.

This was the third earthquake in that region in less than a dozen years. The record shows previous shocks on Nov.

20, 1933, Aug. 31, 1934 and Aug. 22, 1935.

Stations reporting were those of the Jesuit Seismological Association at Georgetown University and Spring Hill College, near Mobile, Ala., and of the U. S. Coast and Geodetic Survey at Tucson, Ariz.

*Science News Letter, January 13, 1945*

## ENTOMOLOGY

### Guayule Bushes Infected With New Aphid Species

► THE PESSIMISTIC rule that whenever man discovers or establishes a new plant crop, some insect pest discovers it, too, has found no exception in the case of guayule, the rubber-producing shrub native to the desert of the Southwest and adjacent parts of Mexico which the war emergency has brought into serious, large-scale cultivation (*Hilgardia*).

A hitherto unrecognized species of aphid has been found infesting the roots of slightly wilted guayule seedlings at the U. S. Government nurseries at Salinas, Calif. After a careful examination confirmed the fact that it is really a new addition to the army of known pests, Prof. E. O. Essig of the University of California has given it the scientific name *Cerosipha californica*. It will be known by the common name of guayule aphid.

*Science News Letter, January 13, 1945*

## ORDNANCE

### 105-Millimeter Howitzer Hauled by Tandem Jeeps

► THE JEEP has reached out and taken on a new job. This handy little quarter-ton war-wagon is now ready to work in tandem-hitched teams to haul the 105-millimeter howitzer, basic field piece of the fighting services (*Field Artillery Journal*, Dec.).

A special tandem hitch, now being mass-produced by the Army's Ordnance Division, makes it possible to hook two jeeps together, nose-to-tail. Their united power enables them to haul the howitzer into any position formerly reached only by the 2½-ton truck that used to have a monopoly on towing the 105.

Jeep drivers are cautioned against being over-enthusiastic when hauling howitzers. Thirty miles an hour on the flat, and ten miles an hour going downhill, are maximum safe speeds. The howitzer outweighs the jeep too much to let it "have its head" on a downgrade.

*Science News Letter, January 13, 1945*

## VOLCANOLOGY

### Kilauea Shows Signs Of Renewed Activity

► IS KILAUEA getting ready for another eruption?

Distinct signs of uneasiness are being shown by the big volcano, but U. S. National Park volcanologists hesitate to make a direct prediction of an outbreak. More earthquakes have been noted of late at Kilauea than in its volcanic neighbor, Mauna Loa. Shortly before the middle of November, an earthquake felt widely on the Island of Hawaii was strong enough to dismantle one component of the Kona seismograph. A few days later an earthquake was recorded originating at a depth of some eight miles, and another Kilauea "shake" had a focus much nearer the surface.

All this may perhaps indicate that lava is rising in the "conduits" under Halemaumau, the crater of Kilauea volcano. Eight more Kilauea earthquakes were recorded during the month, and cracks around the crater have shown a distinct opening. Absence of other indications that usually precede the return of lava to Kilauea's crater, however, make inadvisable any predictions as to what Kilauea may do in the near future.

Even should Kilauea go into another eruptive cycle, no great harm to nearby property is anticipated, still less any interference with war activities centering in these islands. Despite its immense size, Kilauea has always been rated as a well-behaved volcano, its eruptions furnishing gorgeous fireworks but relatively little danger even to nearby spectators.

*Science News Letter, January 13, 1945*

## INVENTION

### Pullman Cars May Have Two-Story Rooms

► PULLMAN CARS to be built after the war can be expected to have not merely upper and lower berths, but a two-storied arrangement of complete rooms. A design for such a two-story sleeping-car is covered by patent 2,364,595, granted to J. K. Tully of Evanston, Ill., and B. E. Jones of Flossmoor, Ill., assignors to the Pullman Company. The construction is very compact, with the upper rooms in a kind of staggered arrangement, slightly forward of, as well as above, the lower ones. When the berths are made up, the sleeping passenger in the lower has his legs partly under the floor of the upper room.

*Science News Letter, January 13, 1945*

## CHEMISTRY

# Miracles in Glass

**It can now be sawed and nailed like lumber, bent like rubber, twisted into yarn, tied into knots and woven like silk; is able to float and bounce.**

By LLOYD STOUFFER

► FOR 4,000 YEARS, glass has been holding out on us. It is one of the strongest and hardest materials known to men, yet, because it has also been so brittle, we have not realized its possibilities.

But today, as the result of war-time research, it is doing jobs no other material could do. And tomorrow it will add immeasurably to the convenience and comforts of living.

In the laboratories and shops of the big glass companies I have seen glass that can be sawed and nailed like lumber, glass that will float, glass that bounces, glass that can be bent like rubber, twisted into yarn, tied into knots and woven like silk.

One of the most exciting of new developments in glass was announced by the American Optical Company just as the old year was closing. It is a kind of glass made without the time-honored ingredient sand, that can be used for storing the highly corrosive but also highly useful chemical hydrofluoric acid. This acid, which attacks silica-containing glass so vigorously that it is one of the most commonly used agents for glass etching, will eat its way out of an ordinary glass bottle or beaker in a relatively short time, and has hitherto had to be kept in vessels of rubber, lead or wax.

## No Sand Used

In the new glass formula, phosphorus pentoxide is substituted for sand. Phosphorus pentoxide in its pure state reacts with water with almost explosive violence. However, the new glass containing it is less soluble in water than ordinary glass.

At Wright Field I saw Air Technical Service Command experts flying an airplane partly made of glass—not window glass, for you can't see through it. In fact it looks just like any other BT-15 trainer. But the fuselage and tail section are made of glass cloth—twice as strong and half as heavy as the conventional aluminum-skinned fuselage. Pound for pound, it's the toughest airplane ever

built—faster, cheaper to produce and longer-lived.

Cloth woven of gossamer-fine, bendable glass fibers, and formed with plastic, is one of the most resistant of all materials to penetration by bullets. It is capable of such flexure that it will actually "give" to a bullet, taking the sting out of it. In firing tests it was found that many high explosive shells which did pierce the glass plane's fuselage passed through it without exploding.

## Extensive Plans

Already, plans are under way to use glass-plastic for crumple-proof automobile fenders, kitchen and bathroom fixtures, streamlined trains and buses, for furniture, luggage and prefabricated houses. One of the newer experimental uses of glass is for artificial legs. The advantages: ease of molding to the exact contour of the natural leg and lifetime resistance to wear.

Surgeons are experimenting with a thread woven of glass fibers as a surgical suture, because it is nonabsorbent and does not irritate the tissues. Strands of special radio-opaque glass yarn have been incorporated in surgical sponges so that a sponge inadvertently left in the wound may be detected by X-ray.

Owens-Corning has produced a glass wool made of fibers two one-hundred-thousandths of an inch in diameter. White, fluffy, glass wool, which is 99% entrapped air, is now being used to insulate B-29 Superfortresses against the deafening roar of the motors, against vibration, against heat and cold, just as it may be used in the walls of homes after the war.

In a Toledo office I was offered a chair with an ordinary-looking cushion. But the cushion was made of glass wool. Only about an inch and a half thick, there seemed to be no end to its softness and resilience. Sooner or later it may be used—as it is now being used in warplanes—for seat cushions and mattresses in airplanes, trains and buses.

Glass is the most nearly perfect-elastic material known. Up to the point of strain at which it breaks, it will return instantly to its original shape. At Owens-

Corning I was given a sheet of glass cloth, not woven but matted of very fine fibers. It felt like the soft paper padding at the bottom of a candy box. I wadded it up tightly in my fist, then dropped it on the desk. It was uncanny to see it straighten out, not even wrinkled.

A coarser, standard form of glass wool, when compressed and faced with smooth, plasticized glass cloth, makes a lightweight insulating "board" which is now specified by the Navy for instrument boards and interior partitions on all ships. It is unaffected by sea water, and completely fireproof; it absorbs vibration and the noise of gunfire; it cuts 60 tons off the weight of a battleship.

Glass in this form may be sawed and nailed, or bolted. After the war it may be used in automobiles in soundproof and heatproof automobile floorboards and dashboards and as insulating walls in prefabricated houses.

Portable army shelters designed for use in remote outposts are heavily insulated with glass wool to save fuel. In Iceland, for instance, where there is no wood or fuel of any kind, the fiber glass in a typical shelter saves over 20,000 pounds a winter in weight of fuel that would otherwise have to be flown in.

Foamglas, made by the Pittsburgh-Corning Corporation, looks like an extremely porous, coal black brick. One-third lighter than cork and far more buoyant, Foamglas can be used in life belts, life rafts and submarine net floats, and, in slabs two inches thick, as insulation for the roofs of war plants. It is cut with an ordinary carpenter's saw.

## Research Headquarters

The Corning Glass Works, at Corning, N. Y., is a fountainhead of research from which most of these modern miracles have come. In each case Corning has merged its knowledge with the knowledge and facilities of another company which could contribute to rapid production and distribution. This accounts for Owens-Corning, formed with the Owens-Illinois Glass Co., which shares the credit for fiber glass; Dow-Corning, in association with the Dow Chemical Co., and Pittsburgh-Corning, with the Pittsburgh Plate Glass Co.

Corning researchers, who discovered Pyrex, now have a kind of super-Pyrex ware. Trade-named Vycor, it is as far



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The instrument shown in the small picture at the left is the RCA "Universal" model, which permits direct magnifications ranging from 100 to 20,000 diameters, in 40 steps. This is the last word in modern microscopy.

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## Do You Know?

The *Pribilof islands* in the Bering sea, the only land that the seal herds visit, have a present seal population of approximately 2,750,000.

The Pit river *hydroelectric project* in northern California, just completed, will deliver over 200,000 horsepower of electric energy for Pacific coast war industries and rural uses.

The *Piney Woods*, the great timber area that stretches from the Potomac to the Gulf of Mexico and into Texas and Arkansas, produces 40% of the nation's lumber, nearly 50% of its pulpwood, and all of its turpentine and rosin.

The Union of South Africa is pushing a program of supplying *food yeast* cheaply enough so that it can be included in the diet of all classes; the raw material for its production is domestic molasses.

Evaporated and condensed *milk* are now being canned in Peru in large enough quantities to make that country independent of importation after the war; Peru in prewar days got almost her entire supply of canned milk from the Netherlands.

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## From Page 26

beyond Pyrex as Pyrex was beyond common glass. Because it will resist heat up to 1650 degrees Fahrenheit and will contain chemicals that would destroy most other materials, it is opening up a new world of electronics and chemistry. Without it some of our secret war weapons would have been impossible of achievement.

Glass piping was tried several years ago as an answer to the problem of corrosion in food and chemical plants. A new tempered glass pipe is resistant to breakage, and new methods of electric welding make it possible for a mechanic to make joints as easily as he would with metal. In one chemical plant, pumps with stainless steel surfaces used to last 60 days. Six glass pumps installed three years ago are still in use, with no signs of wear.

Corning researchers now have glass ball bearings which will withstand a pressure at which metal would flow like putty. I saw a coil spring made of glass that had been tested by being compressed several million times—with no hint of the fatigue which eventually afflicts all metals.

I was shown a radiant heater—a slab of tempered glass about 18 inches square with a continuous strip of thin metal foil on its back surface. It uses ordinary house current. Something like it may provide the ideal radiant house heating—glass panels in the floors and walls of every room.

### New Glass Tough

The new glasses are tough. At Libbey Glass I picked up a beer glass, still warm, from the conveyor belt. "Drop it," said the publicity man with me. I did. Instead of shattering on the cement floor, it bounced crazily from side to side, and I picked it up on the fourth bounce, still whole and unscratched.

Even before the war, Libbey-Owens-Ford produced a tempered glass which, in three-quarter-inch slabs, was tough enough to be hung on hinges and used as doors. Further toughened through multiple laminations, such glass is being used today as transparent armor plate in airplanes. It will stop armor-piercing bullets up to .50 caliber.

The new glass is equally striking in its resistance to extremes of heat and cold. At Libbey-Owens-Ford they put a pane of Tuf-flex on a cake of ice and poured molten lead over it, without

effect. The Army uses this glass as the facing for its 800-million-candlepower searchlight; it won't crack even though snow may be falling on it.

To meet another war need, physicists discovered a way to curve glass with virtually no distortion of vision—something never done before on a mass-production basis. Today curved sections of glass are replacing plastic in bomber noses where maximum vision is required. Tomorrow this glass can be used to streamline automobile windshields.

We think of glass as a brittle material that will have a sharp, cutting edge wherever it is broken. But at Corning I thrust my hand deep into a large box of broken bits of glass and didn't get a scratch. This new type of glass is being used in the globes of runway lights at Army airports, so that if broken and scattered it doesn't cut the tires of planes. Think what this will mean to motorists after the war when headlights may be made of it.

Because of their reputation for doing the impossible with glass, the Corning laboratories have more than their share of freak ideas from volunteer correspondents. At various times it was suggested that they make glass mousetraps, glass coffins, a glass dirigible, glass zip-pers, glass razor blades, glass bathtubs and a glass freight car. This last idea, was to permit green oranges, for example, to be ripened in transit by the sunlight.

No idea, however far-fetched, is dismissed lightly. All are investigated and reported upon. Some of the war-time pipe dreams may one day become realities.

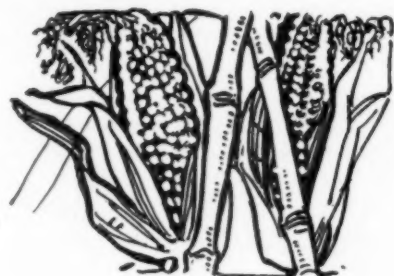
(This background story on new uses of glass will appear in Reader's Digest for February.)  
Science News Letter, January 13, 1945

### ORDNANCE

## Bomb Casings Quickly And Cheaply Produced

➤ FASTER and faster falls the rain of bombs on the cities of Germany and Japan; faster and faster must American factories turn them out. A method for producing bomb casings quickly and cheaply out of interchangeable stamped-metal halves won patent 2,366,374 for John C. Whitesell, Jr., of Norristown, Pa. An outturned flange at the edge of each longitudinal half of the casing makes riveting together easy; tail-fins are as easily riveted on.

Science News Letter, January 13, 1945



Alien Corn

► A GAMBLE with crops and climate, on an unprecedented scale, has been forced on UNRRA through the necessity for sending immediately great quantities of American farm seeds to be used in helping farmers in newly liberated European countries to make their plantings in the spring, and thus to get off relief as soon as possible.

Normally, when seed or nursery stock is sent from one part of the world to another, trial plantings are made in their new home and they are carefully watched for several years to see how well they adapt themselves to the new growing conditions. Only after successfully passing such tests are they recommended for large-scale general planting.

There isn't time, under present circumstances, for such scientifically cautious procedure. Thousands of bushels of seed must be rushed into the hands of the farmers for immediate sowing. If the crops succeed, famine will be averted and whole provinces will be set on the road to rehabilitation. If they do not, there will be want next winter, and many a peasant's trusting faith in America will be shattered. Obviously, much is at stake.

However, the business is not being handled as a mere blind gamble. Scientists working with UNRRA are seeking the best substitute they can discover for the careful testing-out method which cannot be used. Most promising is the close comparative study of European and American climatic maps, to find what are termed "climatic analogues." These are areas on the two continents that are enough alike in their weather, particularly during the growing season, to offer good hope that the crops trans-

ferred from an American area to its European "opposite number" will do as well there as here.

This study is being made under the direction of Dr. Michael Nuttonzon, an American agronomist of European birth, who has had wide experience on both continents and in Asia as well. Dr. Nuttonzon has found many promising climatic analogues, and is hopeful of turning up more. Greece, for example, is much like California, and subdivisions of that country find close correspondences in California's large range of local climatic conditions. Yugoslavia has some provinces that are climatic analogues of counties in Washington and Oregon, others that are more like areas in the Midwest or even parts of Pennsylvania. Seed shipments from these particular areas are therefore being arranged for.

One crop that raises special problems is corn. Corn is grown extensively in the valleys of the Danube and the Po, as well as in the Ukraine. But European corn farmers still use the old open-pollinated varieties, growing their own seed. Seed corn available in the United States is now practically all of the new hybrid types, which has to be raised by specialists. If farmers try to use second-generation hybrid corn for seed they run into all kinds of trouble. Agronomists of the American rehabilitation forces have a job on their hands, explaining hybrid corn to European farmers and inducing them to change their practices to meet the requirements of the new-type grain.

*Science News Letter, January 13, 1945*

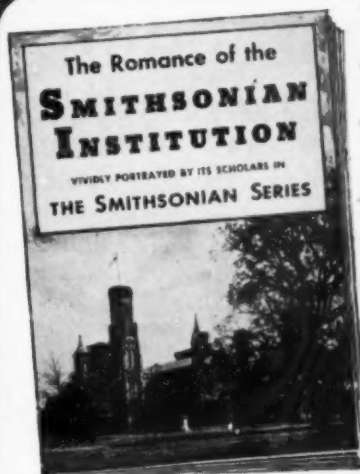
## ORDNANCE

### Tilting Transport Trailer For Moving Heavy Vehicles

► HEAVY, relatively slow-moving motor vehicles such as tanks, bulldozers and tractors, are often road-transported on massive, flat-bedded trailers for greater speed in getting about. The same trailers are also used for salvaging them when they are crippled.

Existing trailers of this kind are usually quite long, and require additional space for the necessary mounting ramps. To diminish this difficulty, Victor J. Hultquist of Alcoa, Tenn., has invented a trailer with a tilting bed, which permits use of a shorter ramp. Suitable hydraulic jacks take care of the tilting, and bring the bed back to horizontal as the load is assisted aboard by means of cable winches. Patent 2,364,365 protects this invention.

*Science News Letter, January 13, 1945*



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## PHYSICS

# Expanding Network

Plans for a nation-wide set-up of coaxial cables for carrying both television pictures and telephone conversations have been revealed.

► PLANS for an expanding nation-wide network of coaxial cables, which may be supplemented by radio relay systems for carrying both television pictures and telephone conversations, have been revealed by Harold S. Osborne, chief engineer of the American Telephone and Telegraph Company.

He reported that the coaxial cable system has been successfully tested for distances up to 800 miles, and that the radio relay system is now under development. A continually expanding program of construction has been undertaken, he stated, in which these systems will link cities up and down the Eastern Seaboard, across the continent and from

the east to Chicago, St. Louis and intermediate points.

"A fundamental feature of the coaxial cable system from the standpoint of economics is that the cable is its own power transmission line," Mr. Osborne stated.

"Another method of providing long distance television transmission which looks promising is the radio relay system," he pointed out. "Approval of the Federal Communications Commission has already been obtained for . . . a development trial of such a system between New York and Boston, and work will proceed as soon as relaxation of war demands makes this possible."

If radio beams are found to have undesirable characteristics, he commented, a super-high frequency system using wave guides may be employed. These wave guides are simply hollow pipes which serve to isolate a little section of space and thus guide the transmission of very high frequency waves, and also protect them against interference. Such wave guides are now used extensively for short distances in ultra-high frequency work.

A comprehensive and highly trained maintenance force is necessary for the continued satisfactory operation of both systems, Mr. Osborne remarked. In the case of the coaxial cable system, the things to be maintained for a single television transmission circuit include terminal equipment at the ends, amplifier equipment and sources of power at intervals of 50 to 80 miles, simple amplifier equipment at intervals of about five miles without sources of power, and the cable itself throughout the entire distance. In the case of the radio relay system, terminal equipment at both ends and repeater stations with sources of power and antennae structures at intervals of 30 miles have to be kept in working order.

*Science News Letter, January 13, 1945*



## METALLURGICAL ANALYSIS SPEEDED BY A MICRO- PHOTOMETER

Routine analysis in a lab which receives daily about 500 samples of non-ferrous alloys, has been greatly speeded up by the use of spectrographic methods, with a Knorr-Albers Microphotometer to measure and record the line densities. The user finds that the speed and economy of this method "couldn't be approached by wet chemical methods" and that accuracy is equal to or better than the best chemical analysis.

The Microphotometer equipment scans the spectrogram automatically and continuously; records the line densities as a graph, in ink, on chart paper. For further details, see Catalog E-90.



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## ENGINEERING

## High-Wheel Locomotive Has Tubular Boiler

► CASEY JONES' ghost would blink in astonishment at a new locomotive that is at the same time a streamlined em-

bodiment of the "cannon-ball" racers which that intrepid old-time engineer knew more than half a century ago, when high speeds were obtained by using the biggest drive-wheels possible. A modernized high-driver engine has been made the subject of U. S. patent 2,366,465; applied for by the late William E. Woodard of Forest Hills, N. Y., the patent is vested in the executrix of his estate, Phebe H. Woodard.

The old-time high-wheelers made speeds that would compete with those of today's streamliners, but they suffered from the handicap of having to place the great weight of the flue-type boilers above the high axles. This meant a center of gravity so high that even Casey Jones would have had to slow down to get around a curve. The new design obviates this difficulty by substituting a tubular boiler for the old flue-type one, which permits a lower placement and better balance of weights.

Greatest advantage of outside drivers on a locomotive, the patent description points out, is the attainment of high rim speeds with only moderate speeds of reciprocating parts.

*Science News Letter, January 13, 1945*

## BIOCHEMISTRY

## Ultraviolet Rays Produce New Mold Strains

► ULTRAVIOLET rays, which have been used in changing the heredity of seed plants to produce new varieties, are also able to produce new strains of the molds that are now being used to ferment economically valuable acids out of glucose solutions. Dr. Lewis B. Lockwood presented results of experiments carried on at the Northern Regional Research Laboratory of the U. S. Department of Agriculture, located at Peoria, Ill.

In all, 217 strains of an acid-producing mold were irradiated with ultraviolet. Some of these changed in appearance; others did not. Certain of the apparently unchanged molds really had undergone internal changes, for they produced more acid after irradiation than they had before. Of the mold strains that were changed in outward appearance, some were improved as acid-producers, others showed less productive efficiency than before the treatment.

Associated with Dr. Lockwood in this research were Dr. Kenneth B. Raper, Dr. Andrew J. Moyer and Dr. Robert D. Coghill.

*Science News Letter, January 13, 1945*



## Books of the Week

► **WOMEN AND GIRLS** will find answers to many questions and facts to dispel many haunting fears about feminine problems in the simply written, authoritative book, **THE WOMAN ASKS THE DOCTOR**, by Emil Novak (*Williams and Wilkins*, \$1.50).

*Science News Letter*, January 13, 1945

### Just Off the Press

**CLIMATE OF INDIANA**—Stephen Sargent Visser—*Ind. Univ.*, 511 p., illus., \$4.

**DESCRIPTIVE METEOROLOGY**—Hurd C. Willett—*Academic Press, Inc.*, 310 p., illus., \$4.

**HISTORICAL GEOLOGY**, the Geologic History of North America—Russell C. Hussey—*McGraw*, 491 p., illus., \$3.50.

**METALLOGRAPHY AND HEAT-TREATMENT OF STEEL**—Ernest J. Teichert—*McGraw*, 577 p., illus., \$5, 2nd ed. (Ferrous Metallurgy, vol. III).

**METEOROLOGY**, a Practical Course in Weather—George J. Brands—*McGraw*, 235 p., illus., \$2.50.

**PORT TERMINAL OPERATION**—Eugene H. Lederer—*Cornell Maritime*, 430 p., illus., \$5.

**SAFETY AFTER SOLO**, How to Fly 10,000 Hours—John R. Hoyt—*McGraw*, 356 p., illus., \$3.

**SEEING THE INVISIBLE**, The Story of the

Electron Microscope—Gessner G. Hawley, *Knopf*, 195 p., illus., \$2.50.

**WITH THE WATCHMAKER AT THE BENCH**, a Book for the Practical Watchmaker, the Student and all Interested in the Watch Trade, also for Those Engaged in the Aircraft Instrument Making and Repairing Industry—Donald De Carle—*Pitman*, 239 p., illus., 4th ed., \$3.

*Science News Letter*, January 13, 1945

### MEDICINE

#### Healing Time Affected By High Altitudes

► **SOLDIERS** who suffer broken arm or leg bones while fighting in the mountains will be longer in getting over the injury than normal, it appears from studies reported by Major Claude N. Lambert and Major Chester Coggeshall, of the Army Medical Corps.

The lowered oxygen supply at high altitudes, the doctors suggest, induces greater activity of the bone marrow in manufacturing red cells, which carry an abundance of phosphoric esters necessary to deposition of calcium in a healing bone. That would leave the plasma low

in such phosphoric esters and thus interfere with calcium deposition and new bone formation.

The reason for the delayed healing of fractures at altitudes over 5,600 feet is the lack of oxygen in the thin mountain air, the Army surgeons explained. Men who have been stationed at high altitudes for nine months or more are not affected. Their broken bones heal in the usual time. Men who have received injuries at low altitudes and been transferred to high altitudes to complete their treatment did not suffer any delay in the healing of broken bones.

The observations reported were made in Colorado, at an altitude of 5,600 feet, but surgeons at airfields at 8,000 and 10,000 feet have had similar experiences with delayed union of fractures.

The bones that heal slowly after breaks at high altitudes are those that manufacture red blood cells in their marrow. Bones that do not manufacture red blood cells, slowest to heal at low altitudes, heal faster at high altitudes.

*Science News Letter*, January 13, 1945

There is almost as much *zinc* as there is iron in the human body.

## Dietary Protein after Surgery and other Trauma

apparently must be maintained at a level above normal in order to assure proper wound healing\* and at least average resistance against infection.\*\* The feeding of meat, therefore, in adequate amounts, as soon as it can be instituted, appears doubly advantageous: the protein content of meat is high and of highest biologic value; the human digestive tract appears well adapted for handling meat protein.\*\*

\*HOFF, H. E.: Physiology, New England J. of Med. 231:492 [Oct. 5] 1944.

\*\*CRANDALL, L. A., Jr.: The Clinical Significance of the Plasma Proteins, Memphis M.J. XIX:147 [Oct.] 1944.



The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

**AMERICAN MEAT INSTITUTE**  
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# • New Machines and Gadgets •

❁ **SIMPLE PILL dispenser**, recently patented, consists of a small sticky disk attached to the inside of the cap of the pill bottle. When the bottle is inverted, one pill sticks to the disk, and remains held in position until the cover is removed from the bottle and the pill pulled off.

*Science News Letter, January 13, 1945*

❁ **LIFERAFT**, for Army airmen forced to land in the water, has been remodeled to weigh only 18 pounds, including a sail and spray shield. The telescoping mast is made of aluminum. The sail is yellow on one side to attract attention and blue on the other for camouflage.

*Science News Letter, January 13, 1945*

❁ **COUNTERSINKING drill** is a combined metal drilling tool and a countersinking tool to ream out the tops of the holes drilled so that machine screw heads will fit flush with the face of the metal. When the drill has worked its length into the metal, the reamer begins to cut.

*Science News Letter, January 13, 1945*

❁ **JEWELRY CLEANER** is a jar to hold the cleaning fluid and a tight-fitting cover with a center stem projecting downward into the fluid, with hooks near its end to hold rings and other jewelry. On the end of the stem is a small brush that keeps the pieces of jewelry apart and which may be removed for use in cleaning.

*Science News Letter, January 13, 1945*



❁ **PORTABLE electroplater**, a new improved electrolytic brush, can be used to electroplate immovable objects without dismantling them. The picture shows the brush in use. Electroplating compounds are available for use with it in gold, silver, copper, nickel, cadmium and chromium.

*Science News Letter, January 13, 1945*

❁ **A LENS for eyeglasses** has for its main lens portion a transparent plastic resinous material which has relatively thin layers of glass on each side to provide hard surfaces. The glass layers are

of uniform thickness, the optical effect being secured in the shape of the plastic material.

*Science News Letter, January 13, 1945*

❁ **LUMINOUS BATON**, for directing military traffic at night and for other purposes, is a hollow transparent plastic rod, with its outer end capped, screwed over the end of a flashlight. The round inner surface of the rod, by internal reflection, prevents the light from passing out except through six roughened lengthwise strips.

*Science News Letter, January 13, 1945*

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin No. 241.

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## Question Box

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### CHEMISTRY

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